CLAIMS

What is claimed is:

1. A composition comprising:

1) a compound of the formula:

$$A^1(Si[R^1]_2O)_u(Si[R^2][E]O)_vSi(R^3)_2A^2;$$

2) a compound of the formula:

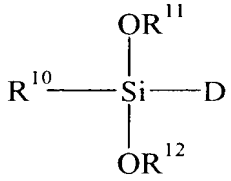
$$B^1(Si[R^4]_2O)_w(Si[R^5][G]O)_xSi(R^6)_2B^2; \text{ and}$$

3) a crosslinker selected from the group consisting of:

a) compounds of the formula:

$$Z^1(Si[R^7]_2O)_y(SiH[R^8]O)_zSi(R^9)_2Z^2; \text{ and}$$

b) compounds of the formula:



wherein

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms;

E is a monovalent organic group comprising at least one epoxy group;

A^1 and A^2 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms and monovalent organic groups comprising at least one epoxy group;

u is an integer from 1 to about 2000;

v is an integer from 0 to about 200;

the sum of u and v is from 1 to about 2200;

G is selected from the group consisting of hydroxy and alkoxy;

B^1 and B^2 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms, hydroxy, and alkoxy;

w is an integer from 1 to about 1000;

x is an integer from 0 to about 50;

the sum of w and x is from 1 to about 1050;

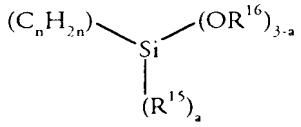
Z^1 and Z^2 are independently selected from the group consisting of hydrogen and alkyl groups of from 1 to 4 carbon atoms;

y is from 1 to about 1000;

z is from 0 to about 2000;

the sum of y and z is from 1 to about 3000;

D is selected from the group consisting of hydrogen, substituted or unsubstituted C_1-C_{12} hydrocarbon moieties, OR^{14}, and moieties of the formula:



R^{10} and R^{15} are independently selected from the group consisting of hydrogen, substituted or unsubstituted C_1-C_{12} hydrocarbon moieties, and OR^{13};

R^{11}, R^{12}, R^{13}, R^{14}, and R^{16} are independently selected from the group consisting of C_1-C_6 hydrocarbon moieties;

n is 1, 2, or 3; and

a is 0, 1, or 2.

2. The composition of claim 1 in the form of an aqueous emulsion.

3. The composition of claim 2 further comprising a catalyst.

4. The composition of claim 2 further comprising at least one surface active agent.

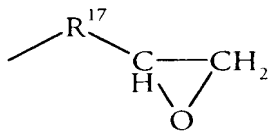
5. The composition of claim 3 wherein the catalyst is selected from the group consisting of metal salts of acids, zinc chloride, magnesium chloride, aluminum chloride, metal soaps, non-polymeric anhydrides, and butyl acid phosphate.

6. The composition of claim 4 wherein the surface active agent is selected from the group consisting of non-ionic surface active agents, anionic surface active agents, and cationic surface active agents.

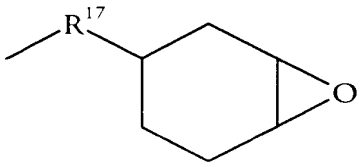
7. The composition of claim 1 wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are all the same.

8. The composition of claim 7 wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are all methyl.

9. The composition of claim 1 wherein E is selected from the group consisting of moieties of the structural formulae:



and



wherein R^{17} is a divalent substituted or unsubstituted organic group.

10. The composition of claim 1 wherein 3)b) is selected from the group consisting of methyltrimethoxysilane, methyltriethoxysilane, ethyltriethoxysilane, methylpentamethoxydisilylethane, tetraethoxysilane, cyclohexyltriethoxysilane and methyltripropoxysilane.

11. A process of treating textiles comprising the steps of:

A) providing an aqueous emulsion comprising a composition comprising:

1) a compound of the formula:

$$A^1(Si[R^1]_2O)_u(Si[R^2][E]O)_vSi(R^3)_2A^2;$$

2) a compound of the formula:

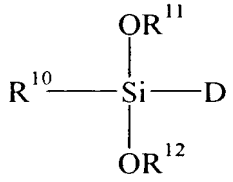
$$B^1(Si[R^4]_2O)_w(Si[R^5][G]O)_xSi(R^6)_2B^2;$$ and

3) a crosslinker selected from the group consisting of:

a) compounds of the formula:

$$Z^1(Si[R^7]_2O)_y(SiH[R^8]O)_zSi(R^9)_2Z^2;$$ and

b) compounds of the formula:



wherein

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms;

E is a monovalent organic group comprising at least one epoxy group;

A^1 and A^2 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms and monovalent organic groups comprising at least one epoxy group;

u is an integer from 1 to about 2000;

v is an integer from 0 to about 200;

the sum of u and v is from 1 to about 2200;

G is selected from the group consisting of hydroxy and alkoxy;

B^1 and B^2 are independently selected from the group consisting of alkyl groups of from 1 to 4 carbon atoms, hydroxy, and alkoxy;

w is an integer from 1 to about 1000;

x is an integer from 0 to about 50;

the sum of w and x is from 1 to about 1050;

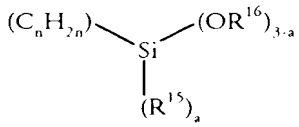
Z^1 and Z^2 are independently selected from the group consisting of hydrogen and alkyl groups of from 1 to 4 carbon atoms;

y is from 1 to about 1000;

z is from 0 to about 2000;

the sum of y and z is from 1 to about 3000;

D is selected from the group consisting of hydrogen, substituted or unsubstituted C_1-C_{12} hydrocarbon moieties, OR^{14}, and moieties of the formula:



R^{10} and R^{15} are independently selected from the group consisting of hydrogen, substituted or unsubstituted C_1-C_{12} hydrocarbon moieties, and OR^{13};

R^{11}, R^{12}, R^{13}, R^{14}, and R^{16} are independently selected from the group consisting of C_1-C_6 hydrocarbon moieties;

n is 1, 2, or 3; and

a is 0, 1, or 2.

B) providing a catalyst suitable to the aqueous emulsion that will promote a condensation reaction between compounds 1), 2), and 3);

C) mixing the aqueous emulsion and the catalyst to form a mixture;

D) applying the mixture to the textile; and

E) heat treating the textile to form a condensation reaction product of compounds of 1), 2), and 3);

whereby the textile has enhanced durability, water repellency, and softness.

12. The process of claims 11 further comprising the step of removing an excess of the aqueous emulsion from the textile.

13. The process of claim 11 wherein the aqueous emulsion further comprises at least one surface active agent.

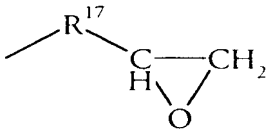
14. The process of claim 11 wherein the catalyst is selected from the group consisting of metal salts of acids, zinc chloride, magnesium chloride, aluminum chloride, metal soaps, non-polymeric anhydrides, and butyl acid phosphate.

15. The process of claim 13 wherein the surface active agent is selected from the group consisting of non-ionic surface active agents, anionic surface active agents, and cationic surface active agents.

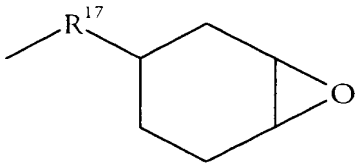
16. The process of claim 11 wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are all the same.

17. The process of claim 16 wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are all methyl.

18. The process of claim 11 wherein E is selected from the group consisting of moieties of the structural formulae:



and



wherein R^{17} is a divalent substituted or unsubstituted organic group.

19. The process of claim 11 wherein 3)b) is selected from the group consisting of methyltrimethoxysilane, methyltriethoxysilane, ethyltriethoxysilane, methylpentamethoxydisilylethane, tetraethoxysilane, cyclohexyltriethoxysilane and methyltripropoxysilane.